

FIG. 1

Fig. 2

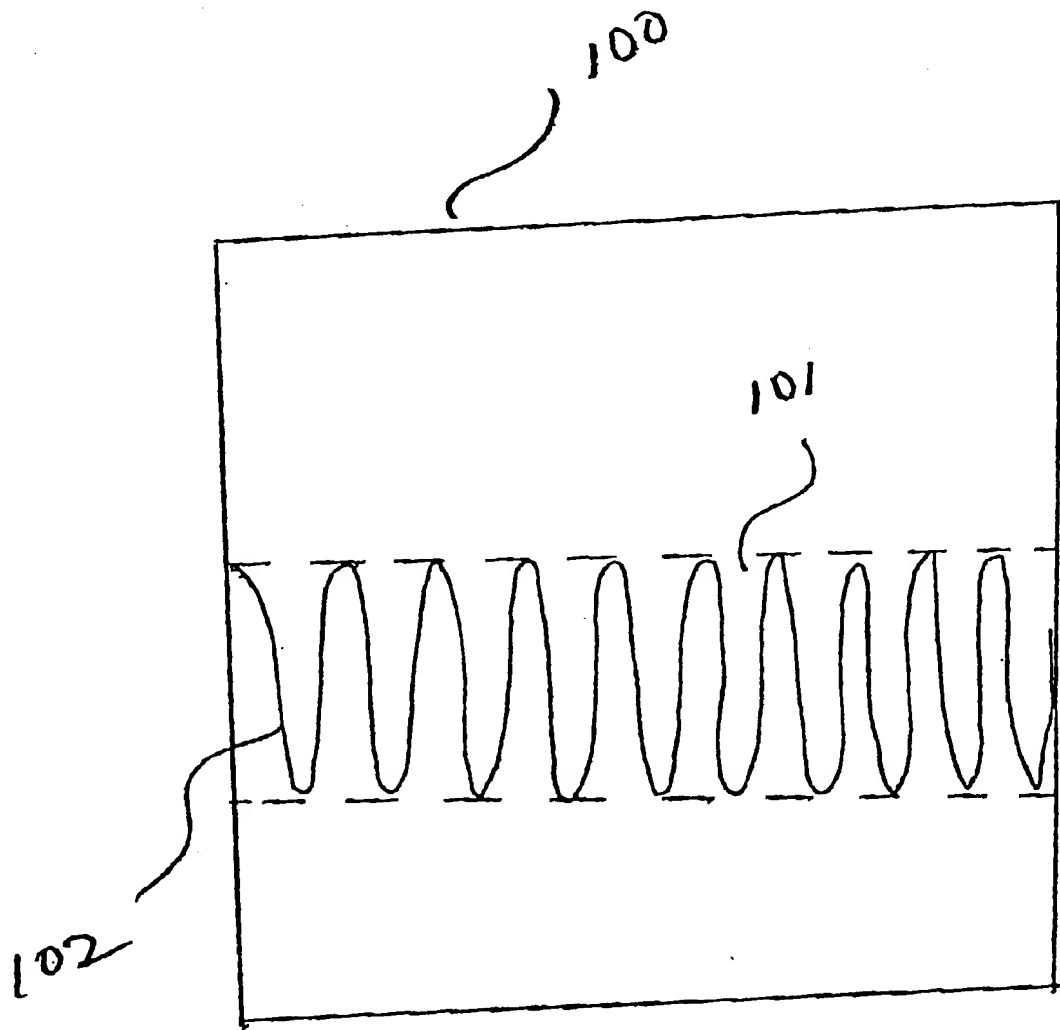


Figure 3

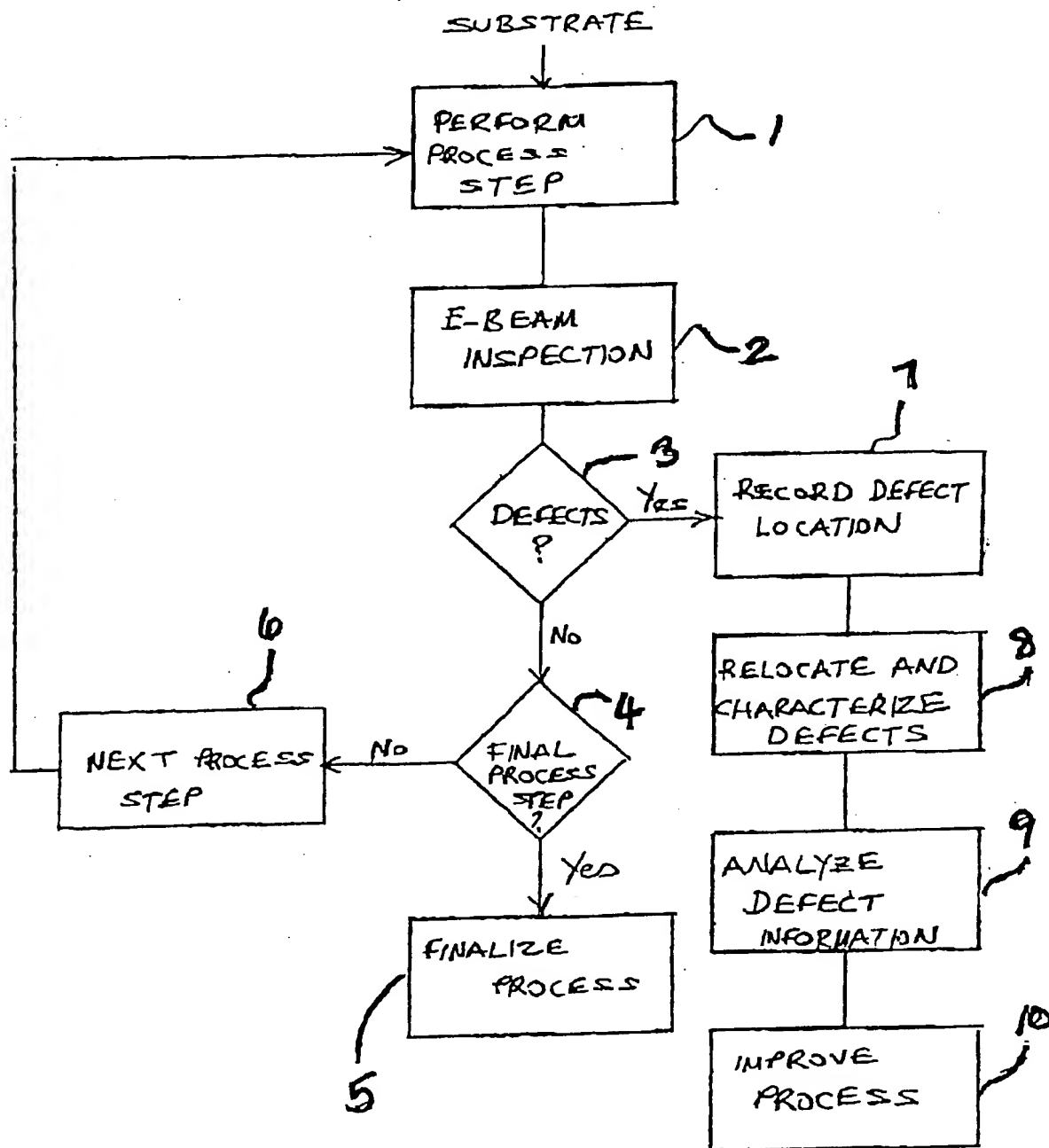


FIGURE 4a

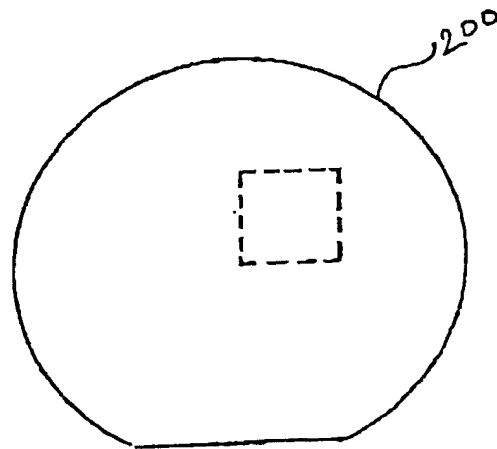
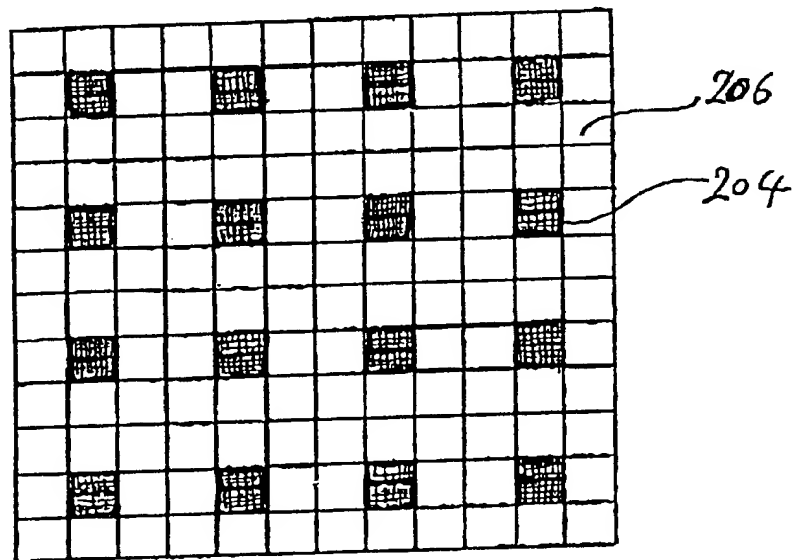


FIGURE 4b



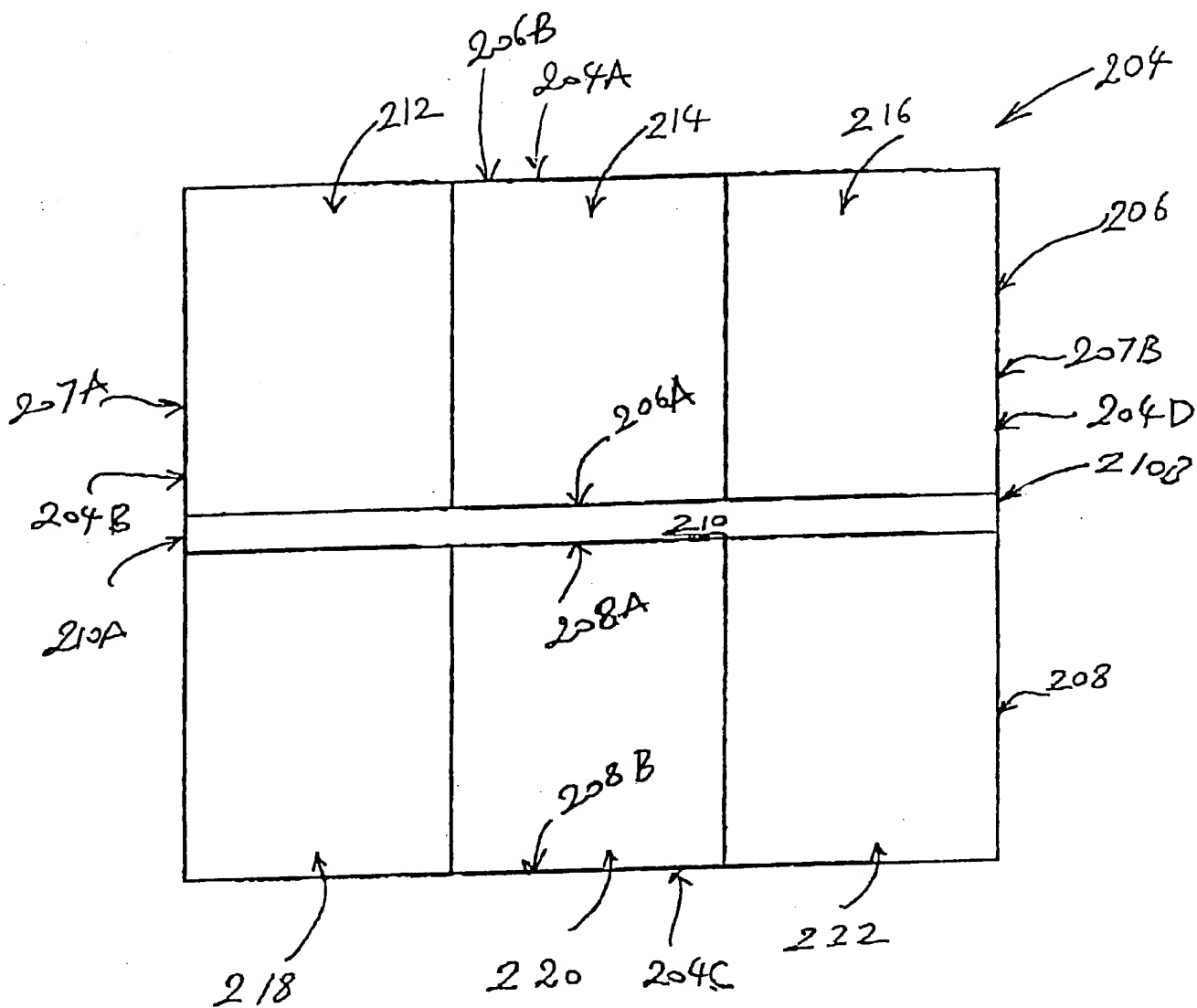


Fig. 4C

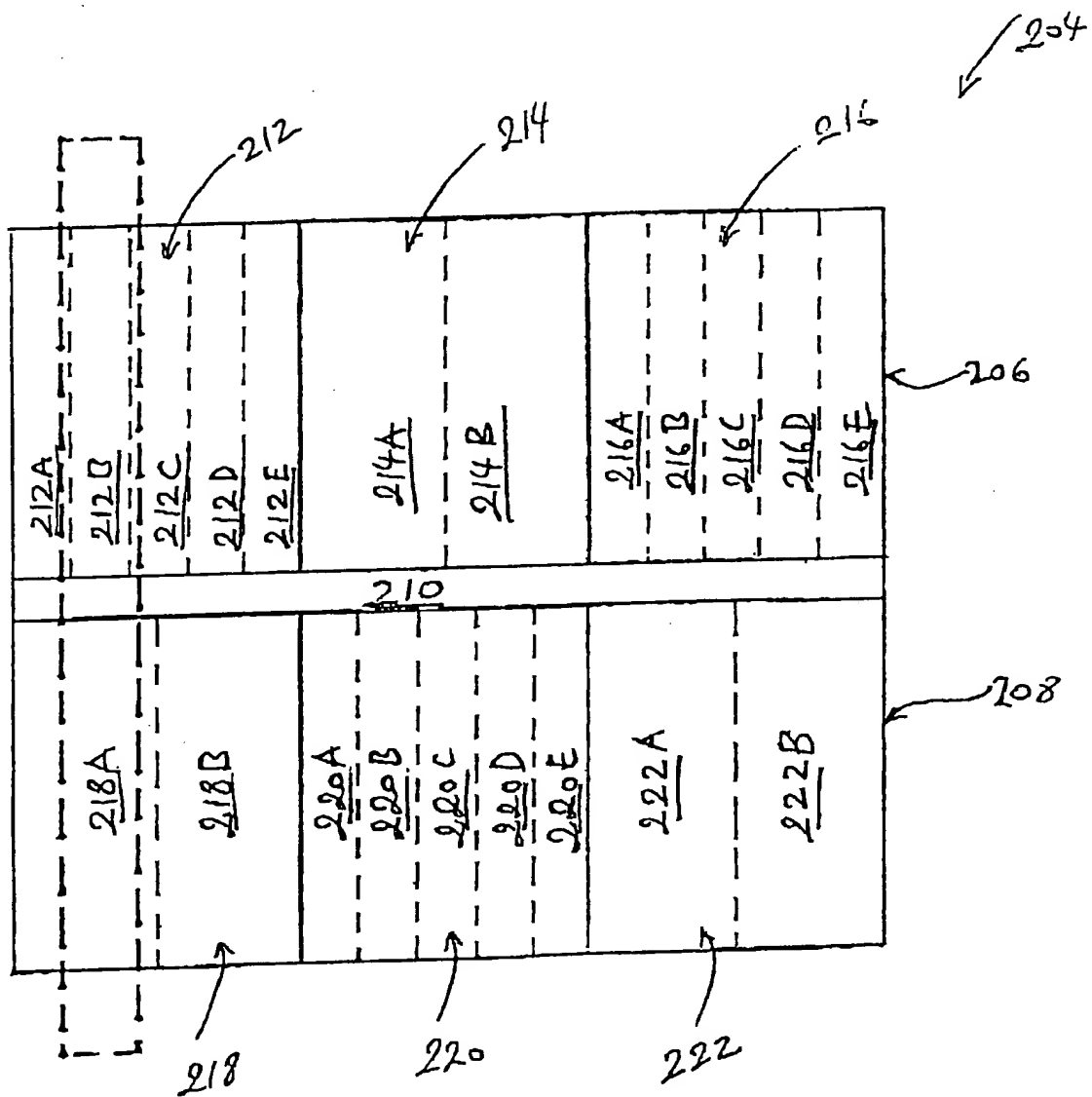


Fig. 4D

FIGURE 5

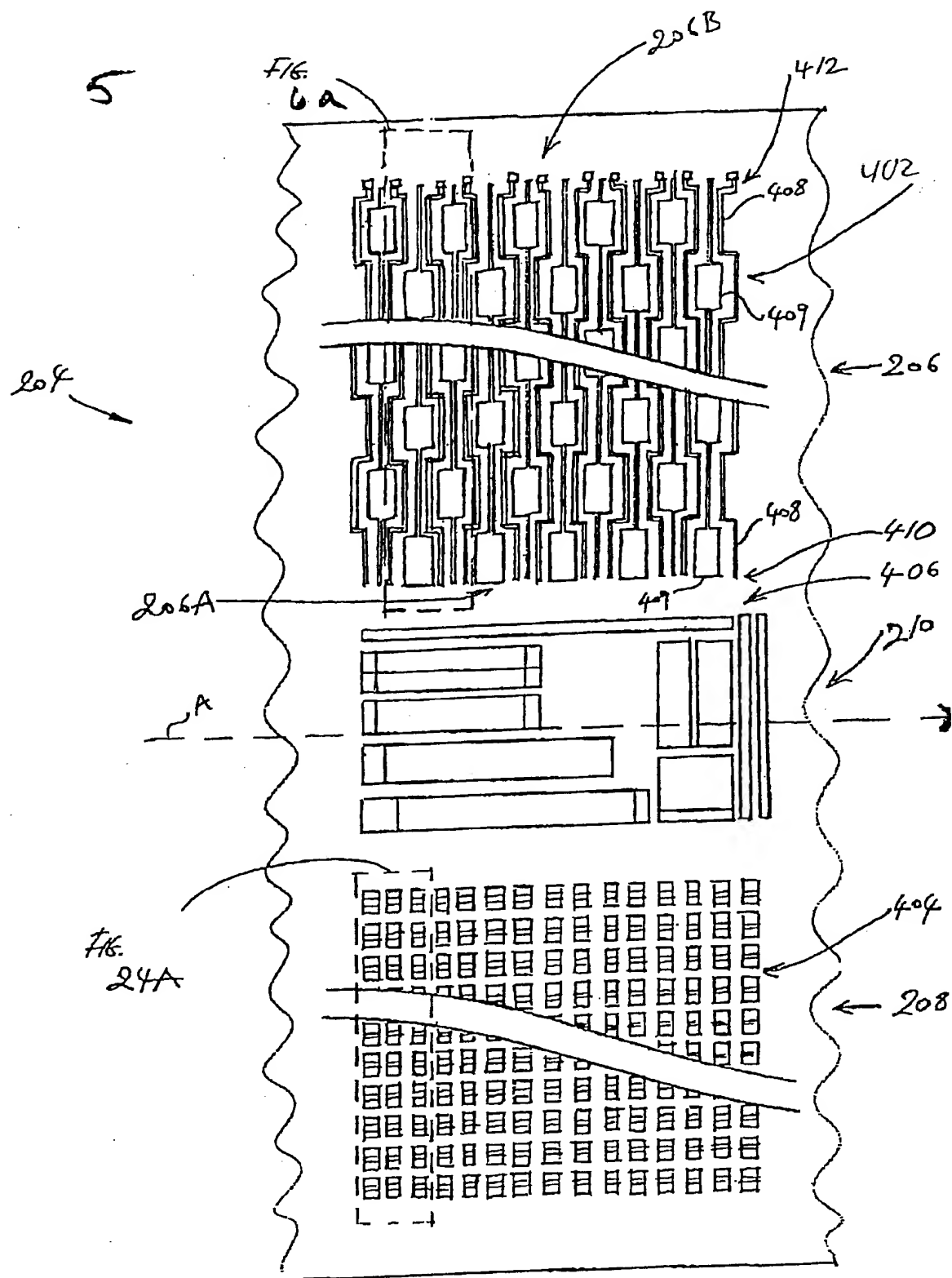


FIGURE 6a

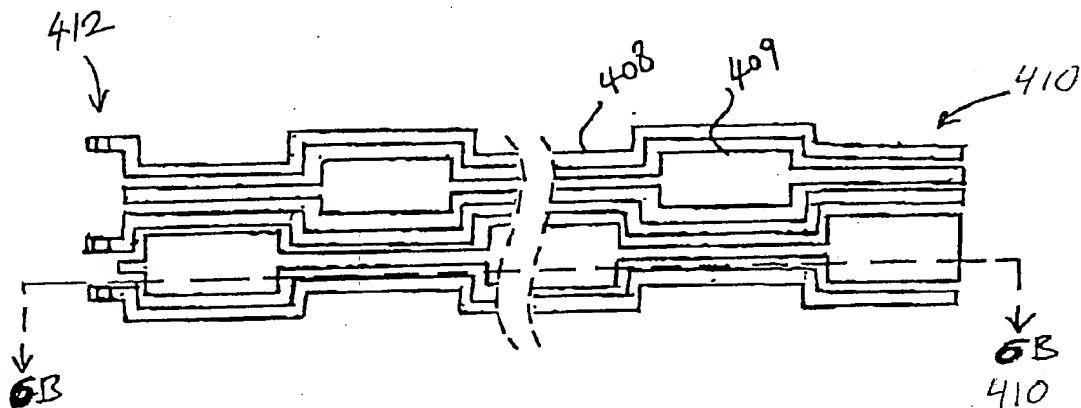


Fig. 6b

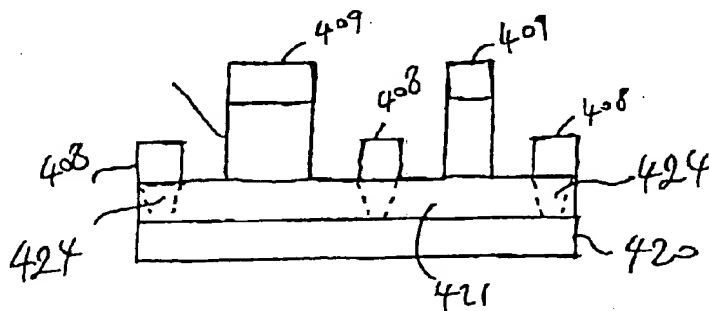
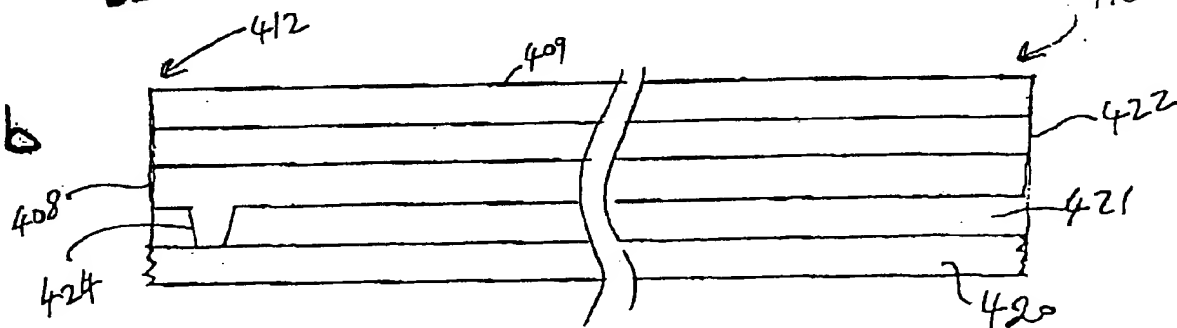


Fig. 6c

Figure 7a

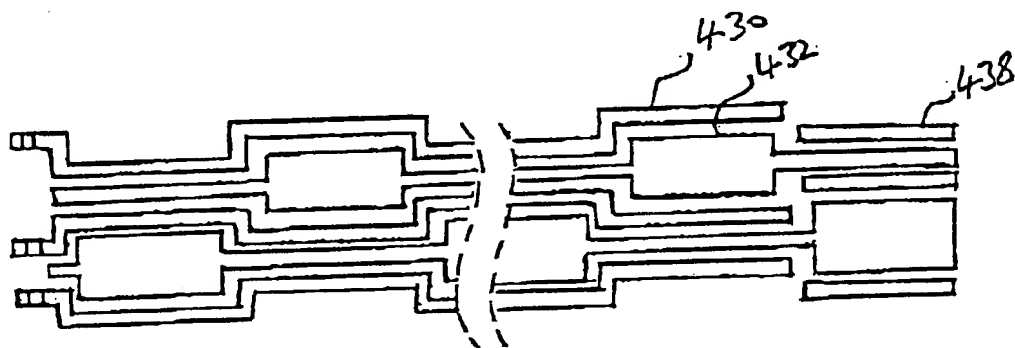


FIGURE 7b

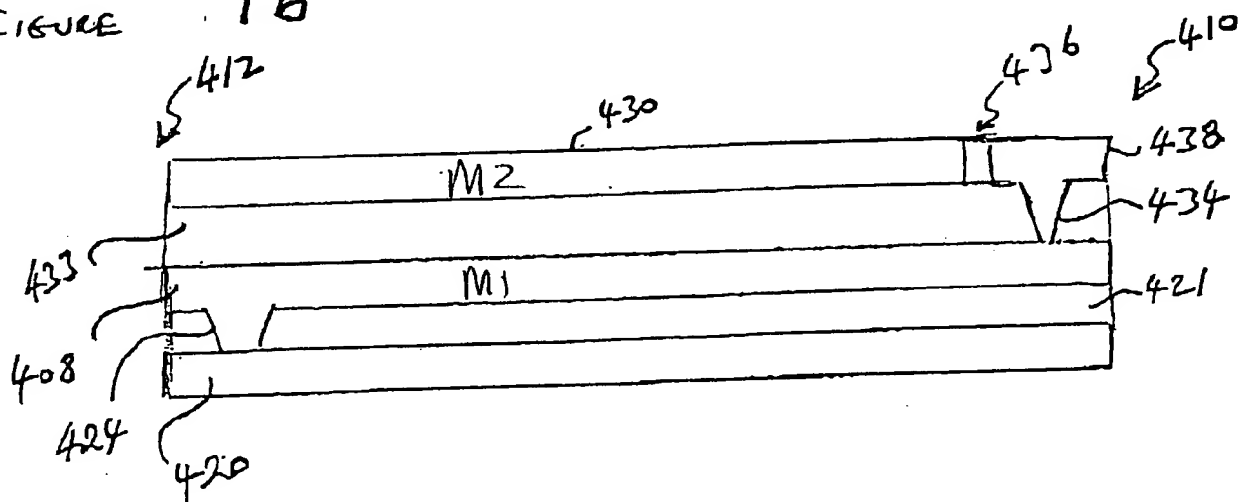


FIGURE 8

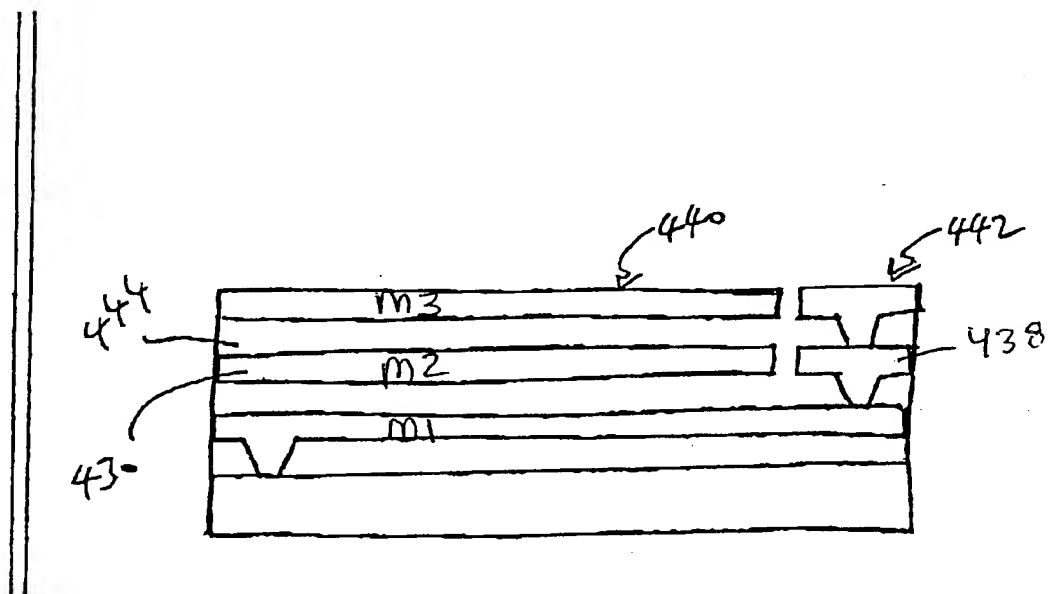


FIGURE 9

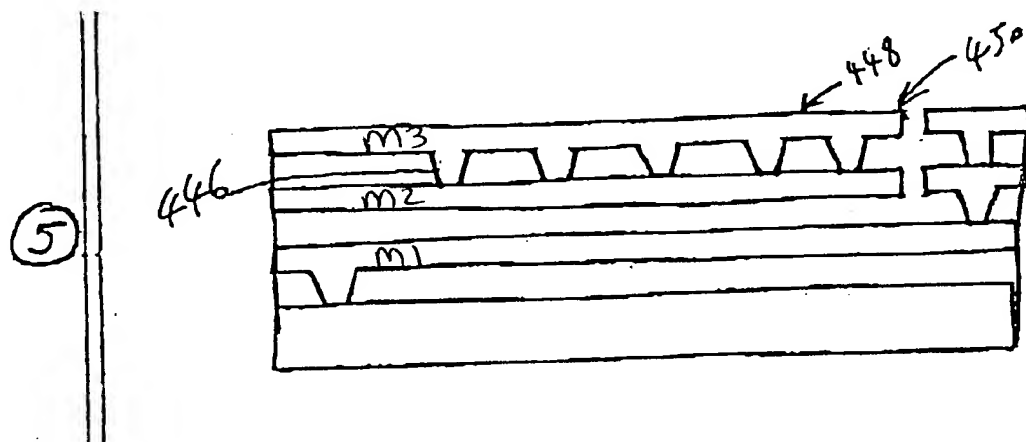
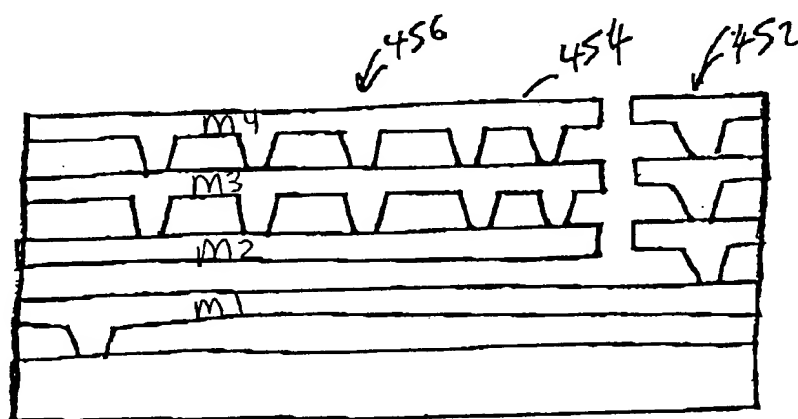


FIGURE 10



FIGURE

11

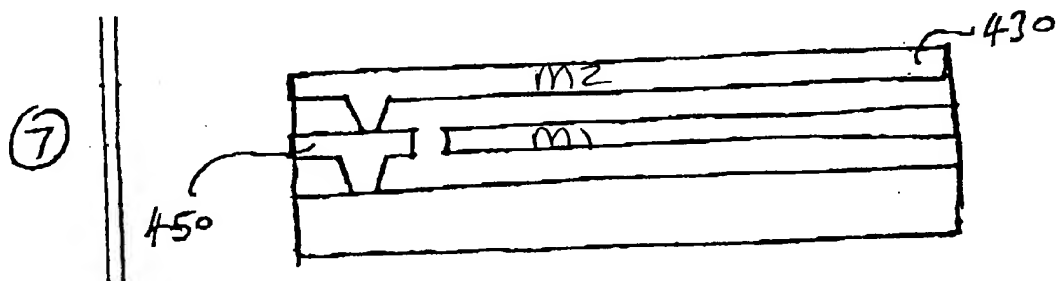


FIGURE 12

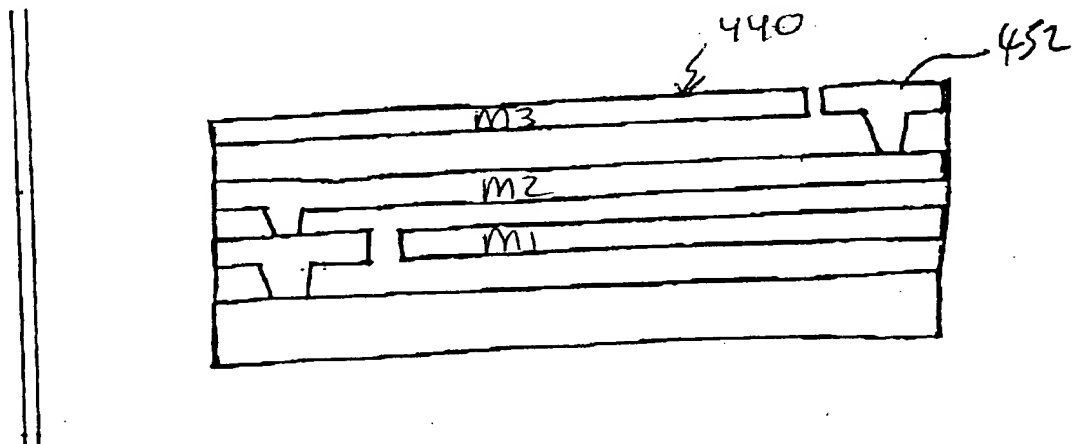
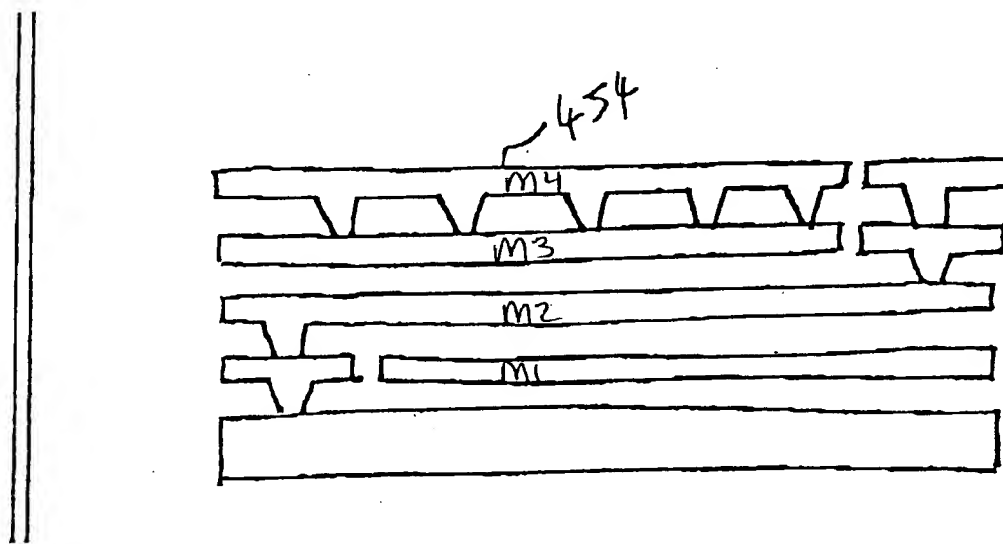
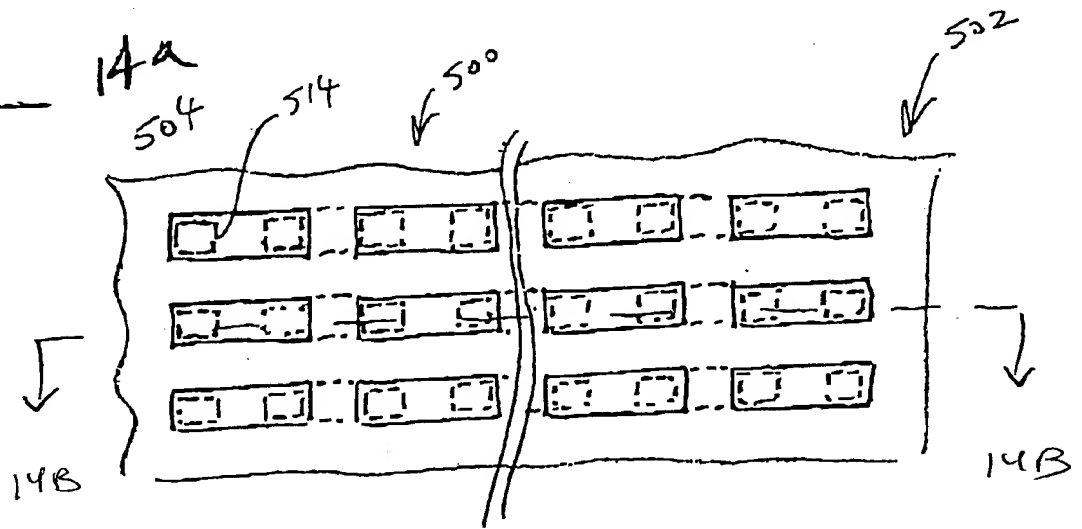


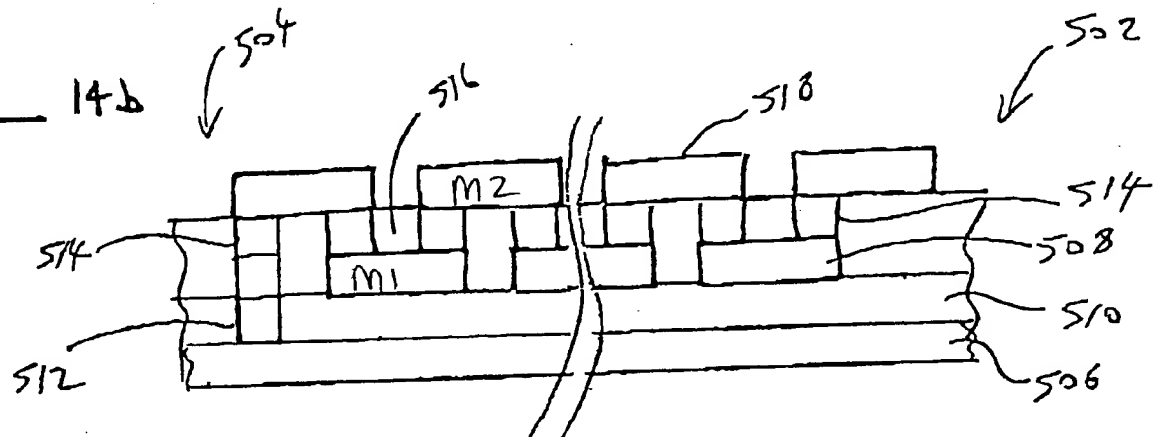
FIGURE 13



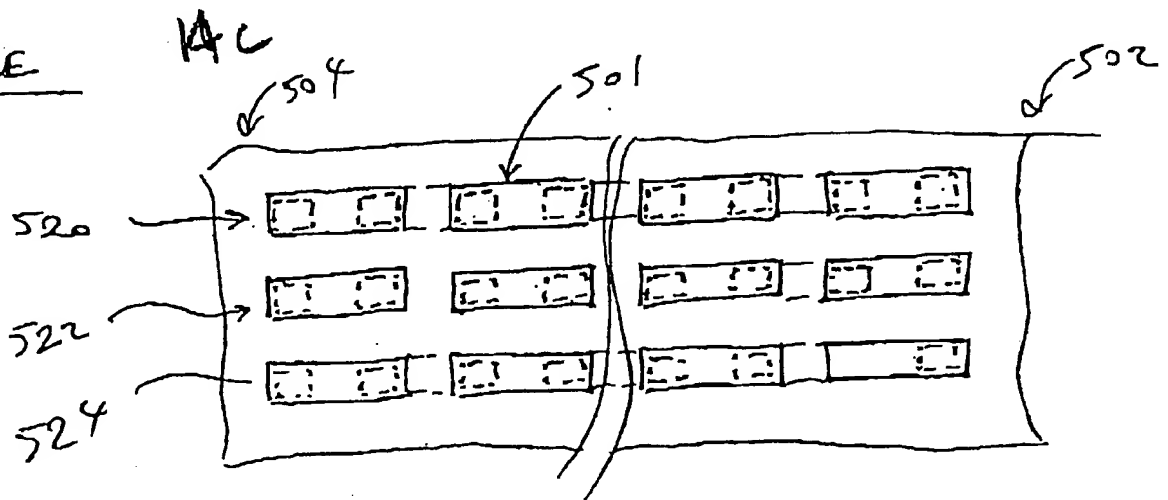
FIGURE



FIGURE



FIGURE



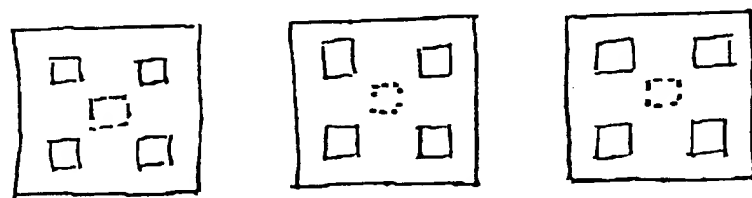
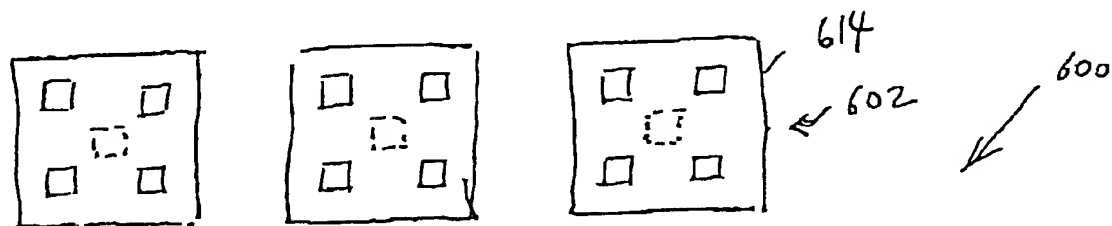
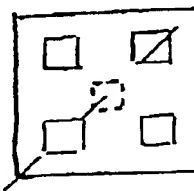
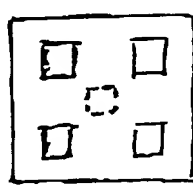
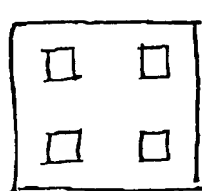


Figure 15A



15B

15B

FIGURE 15B

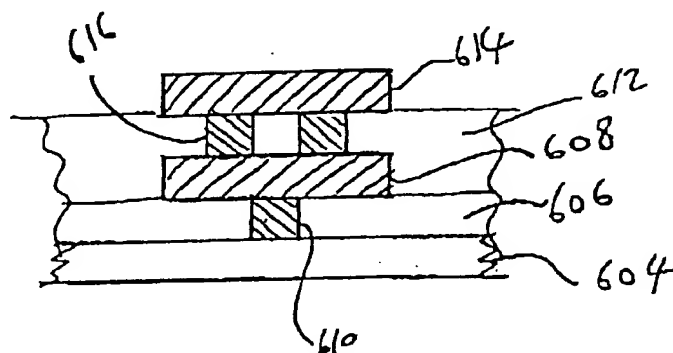


FIGURE 16A

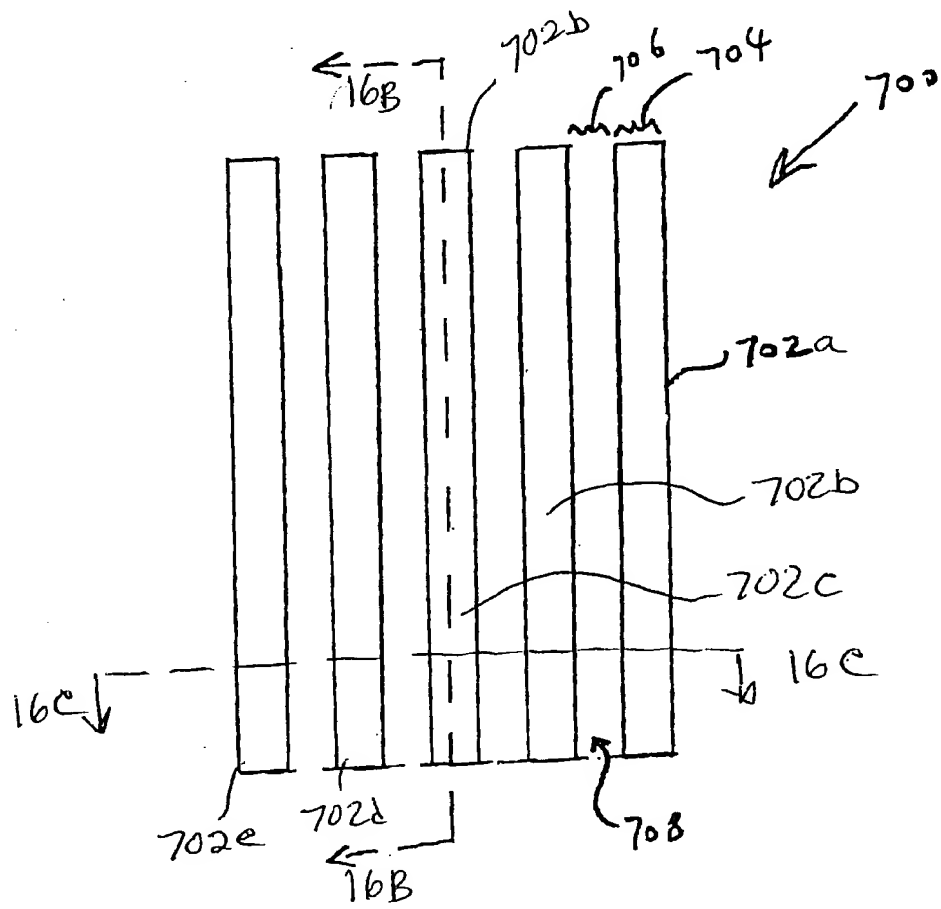


FIGURE 16B

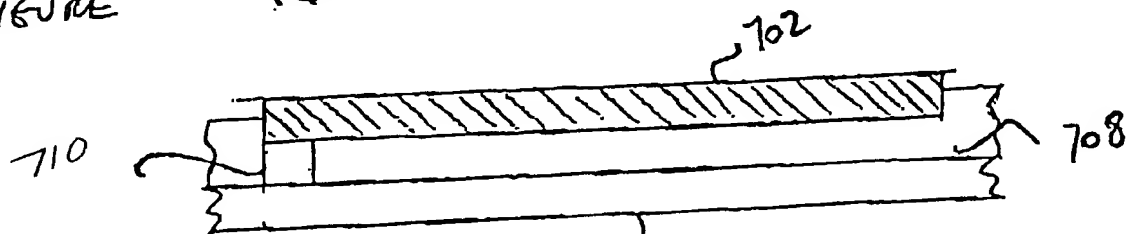


FIGURE 16C

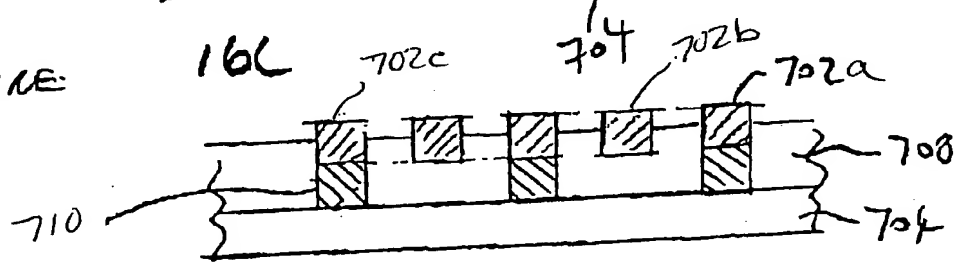
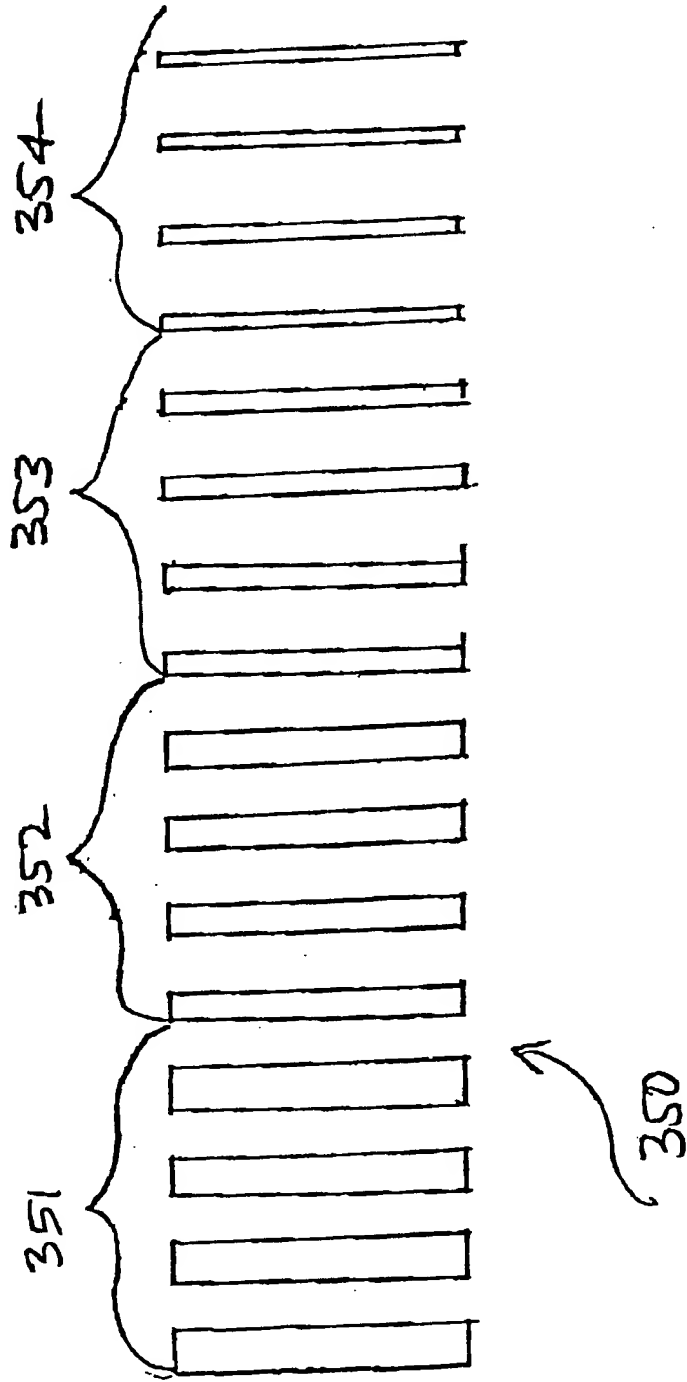


Fig. 17



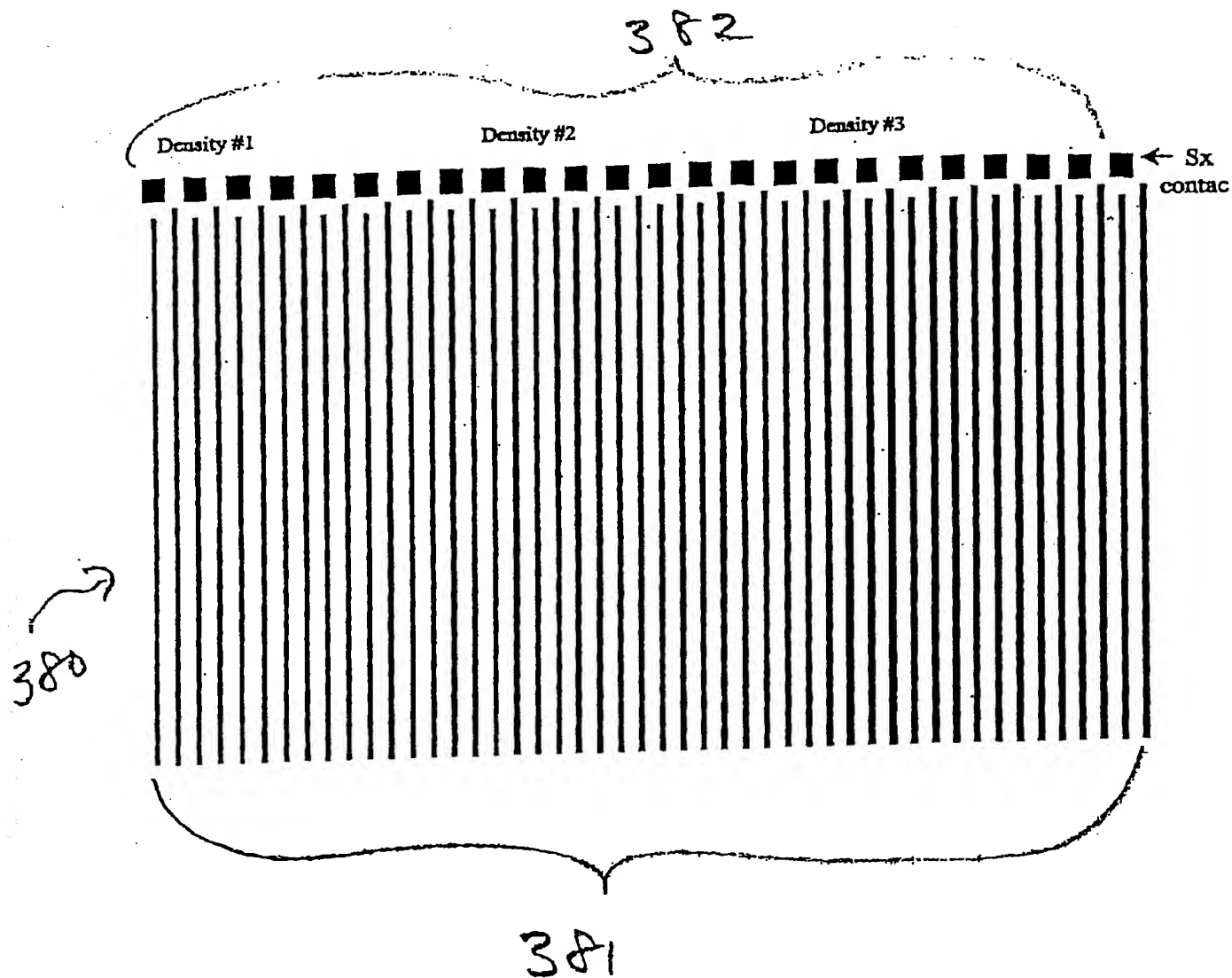


Fig. 1A

FIGURE. 19

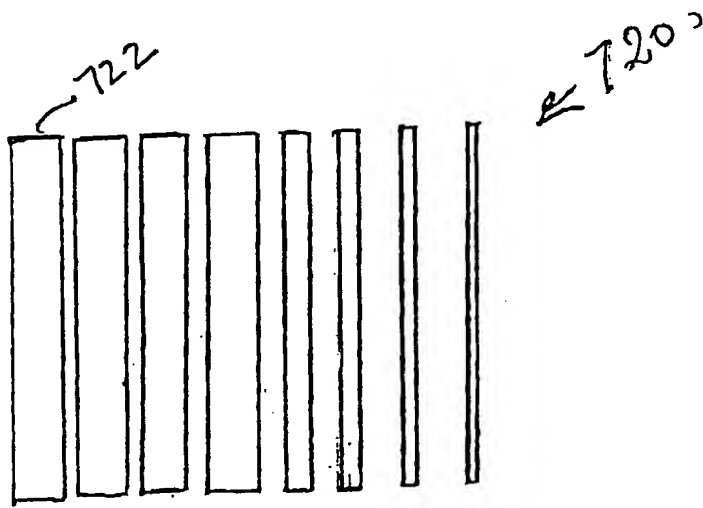
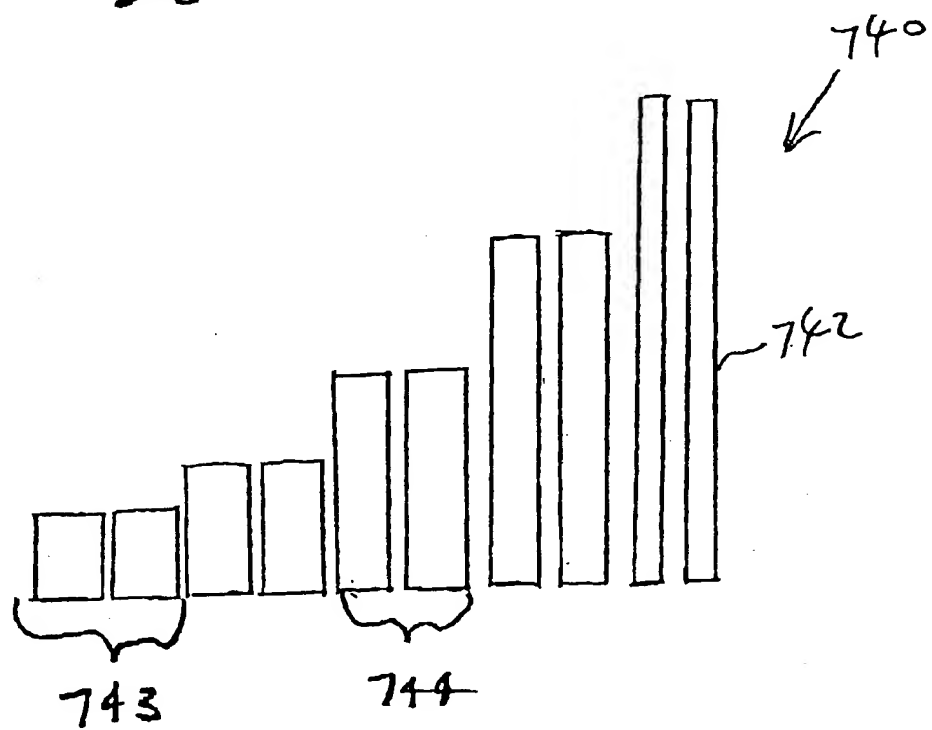


FIGURE 20



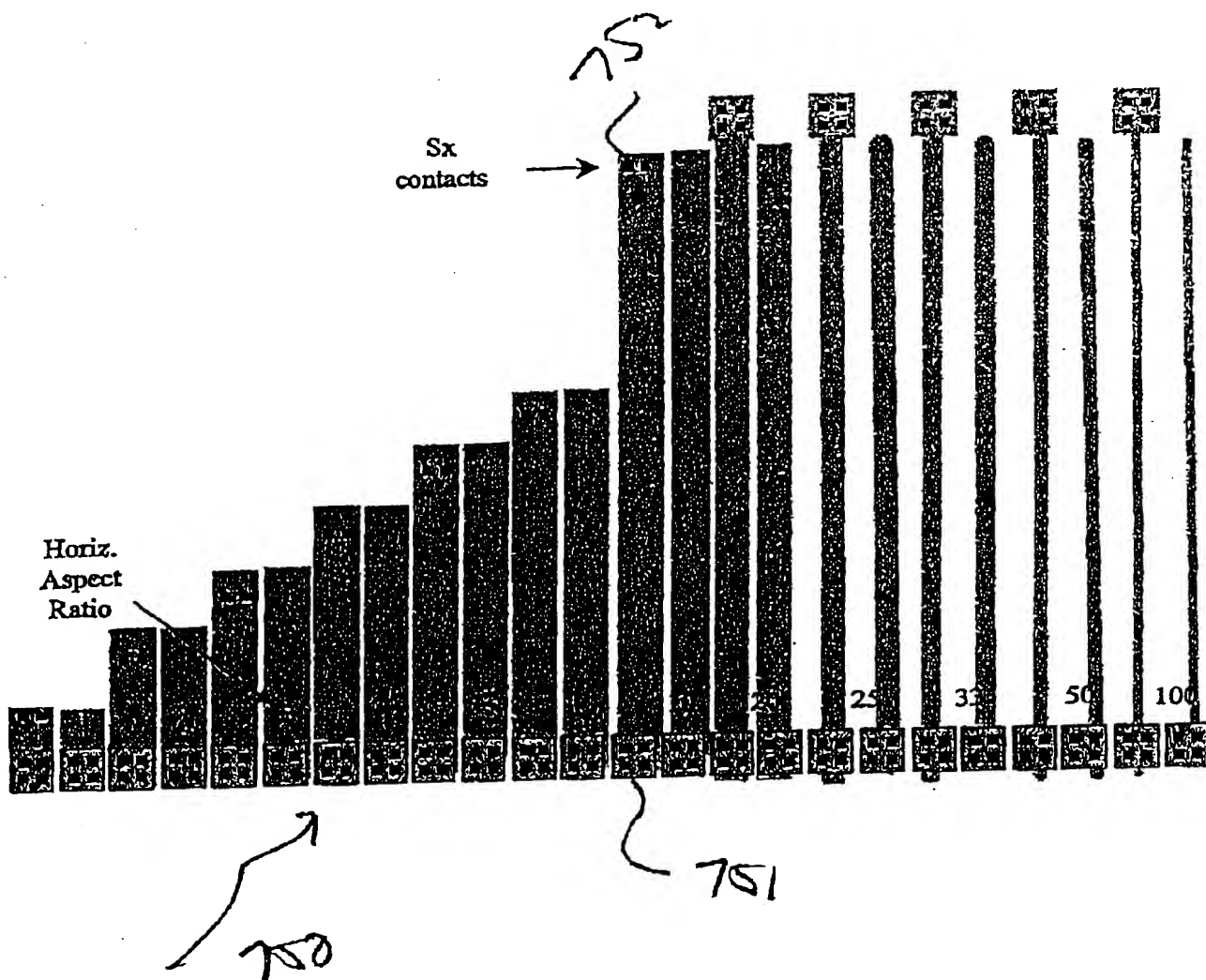


Figure 21

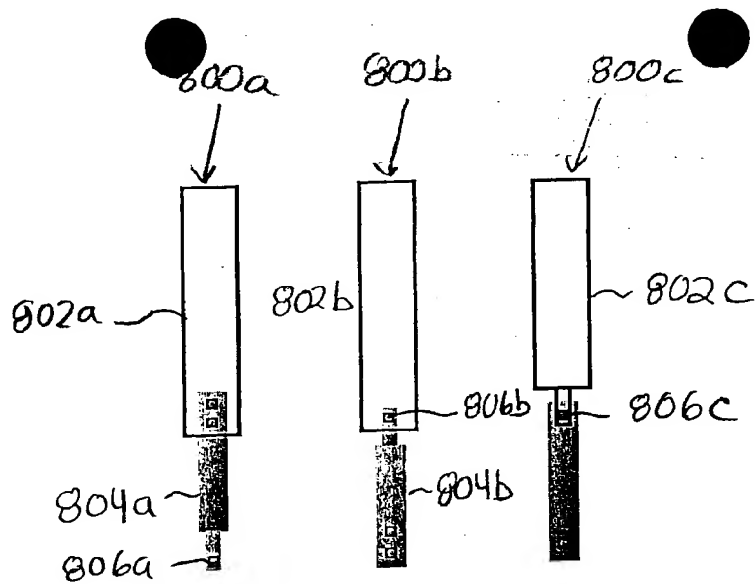


Figure 22A: X Overlay Structures: M1 to Contact, Via to M1, M2 to Via

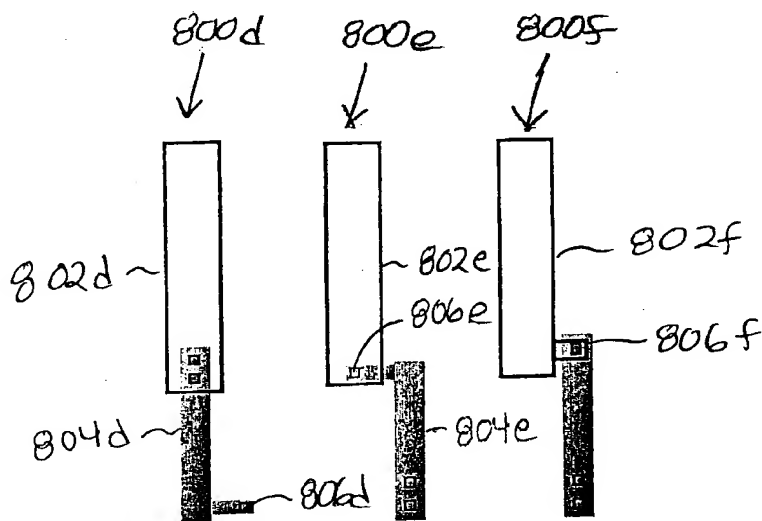


Figure 22B: Y Overlay Structures: M1 to Contact, Via to M1, M2 to Via

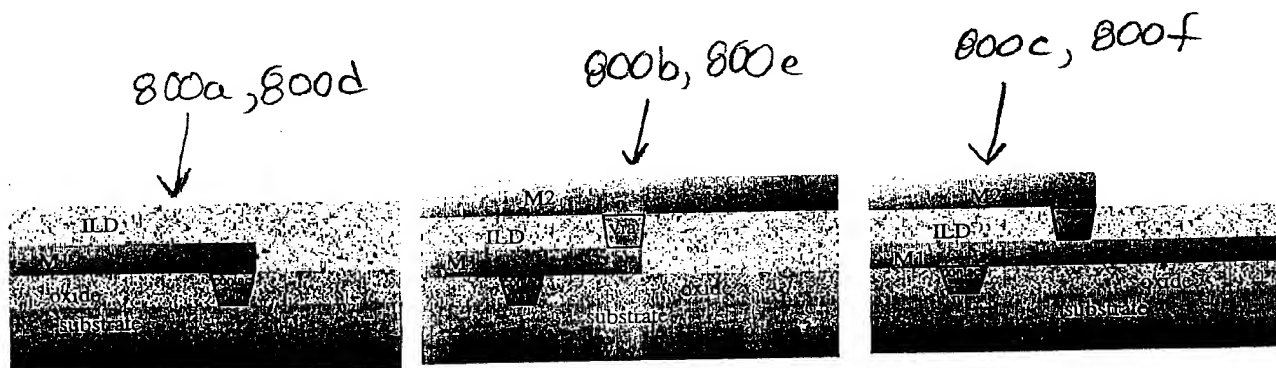


Figure 22C: Cross sections of overlay structures: M1 to Substrate, Via to M1, M2 to Via

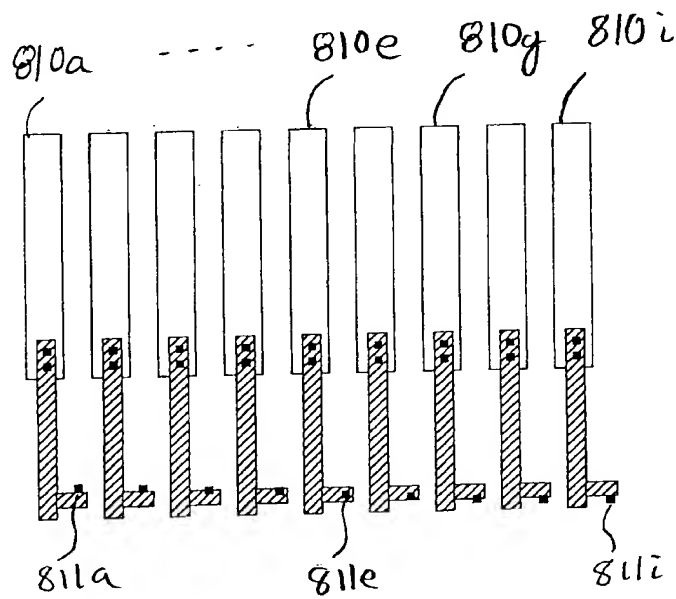


Figure 23A: A portion of the M1 to Contact, Y component, Overlay Structure

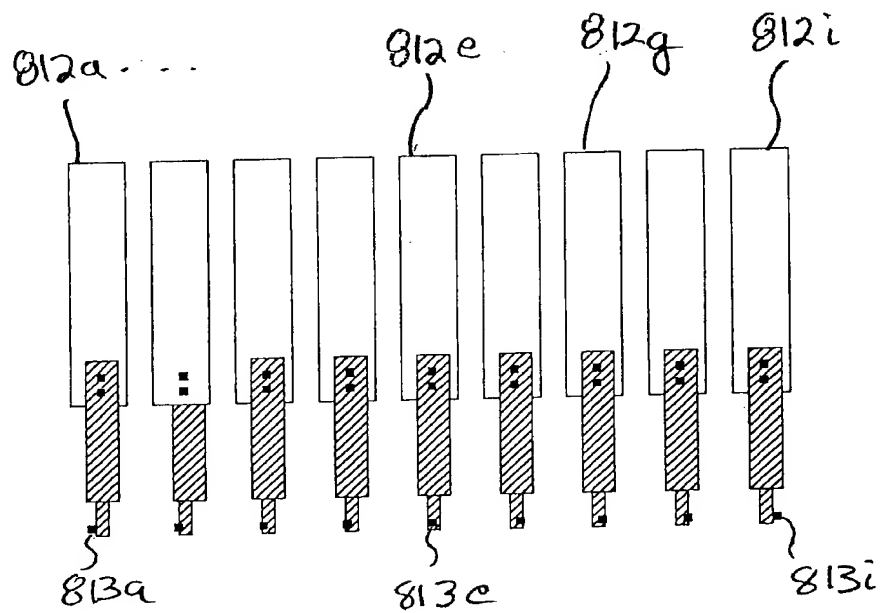


Figure 23B: A portion of the M1 to Contact, X component, Overlay Structure

FIGURE

~~24A~~

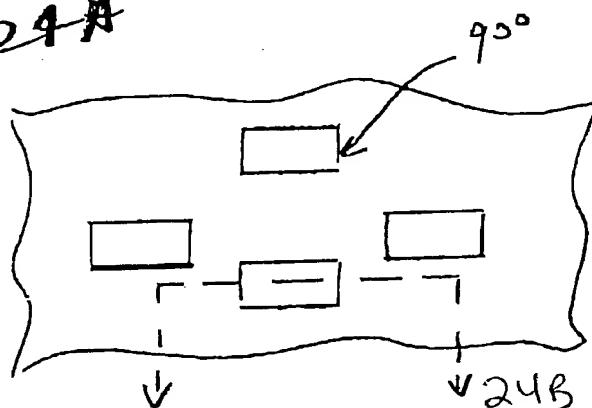
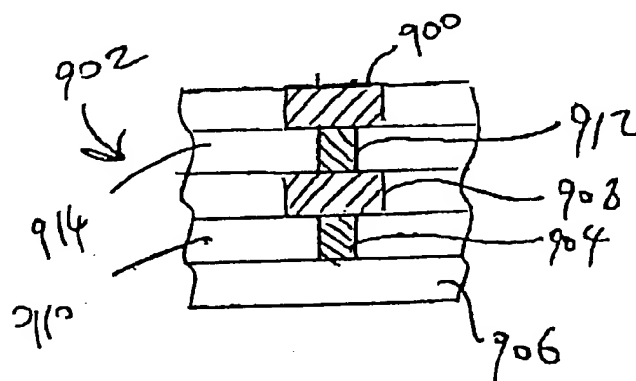


FIGURE
24B



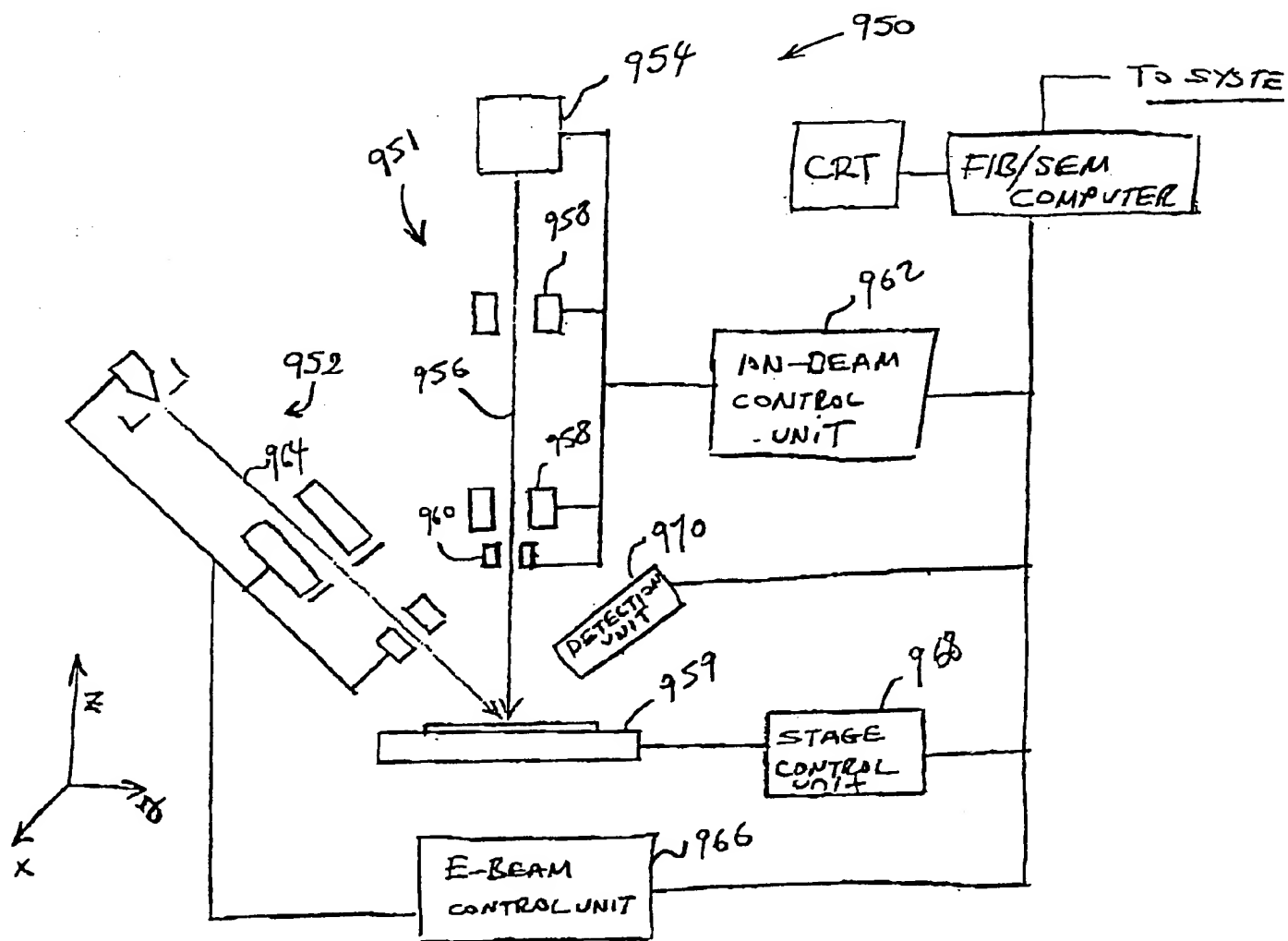


Fig. 25

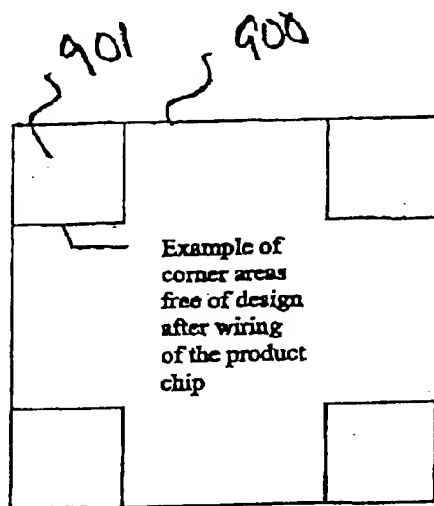


Fig. 26a: Product Chip with empty areas

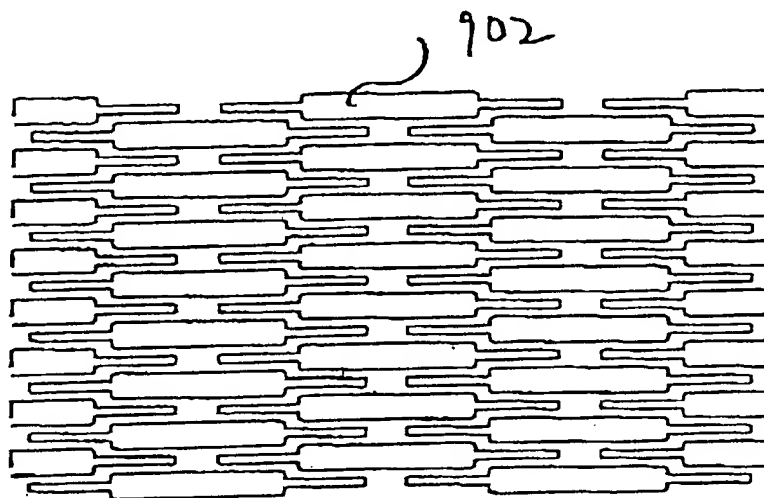


Fig. 26b: Typical "Filler Shapes" used to fill-in the empty

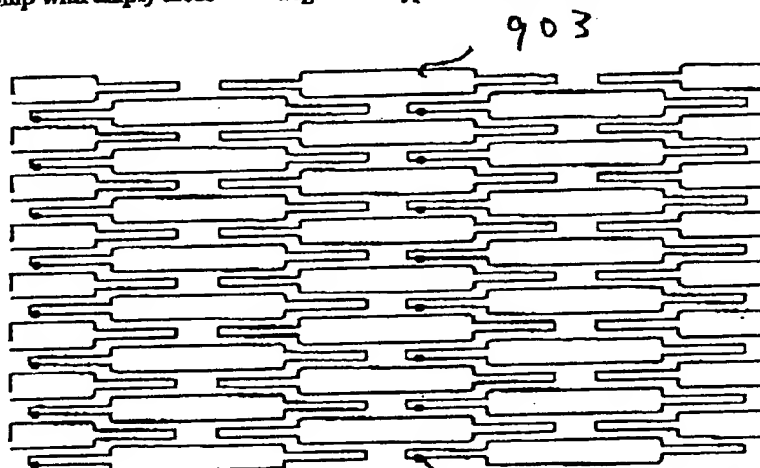
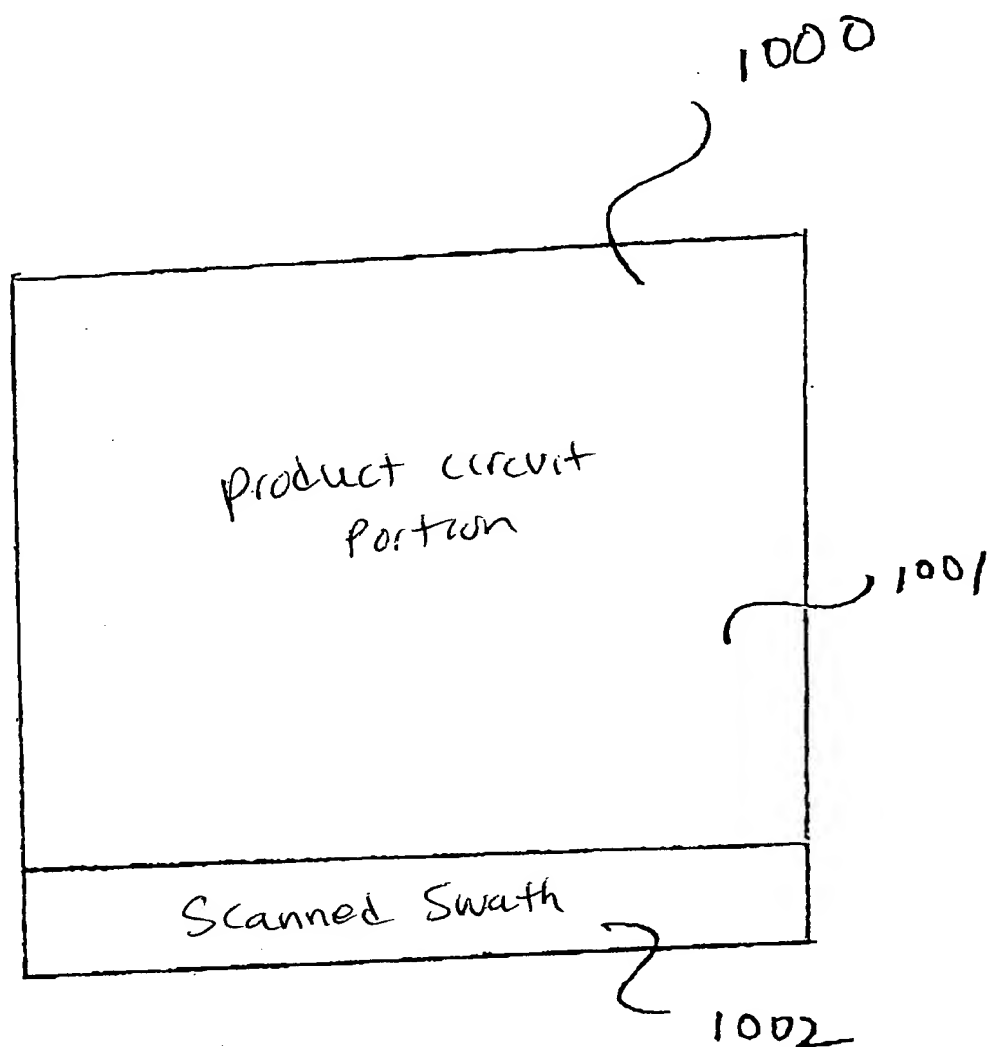


Fig. 26c: Redesign of Dummy Shapes into useful CMP Process Monitors

Fig. 27



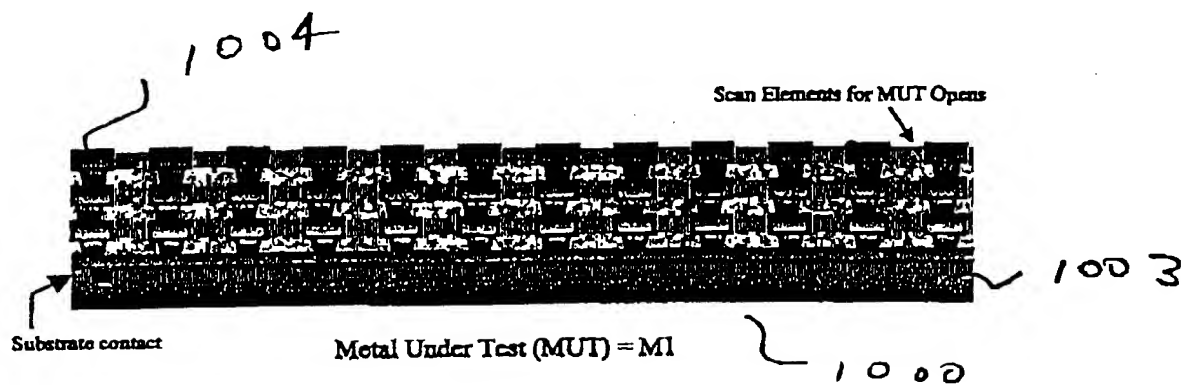
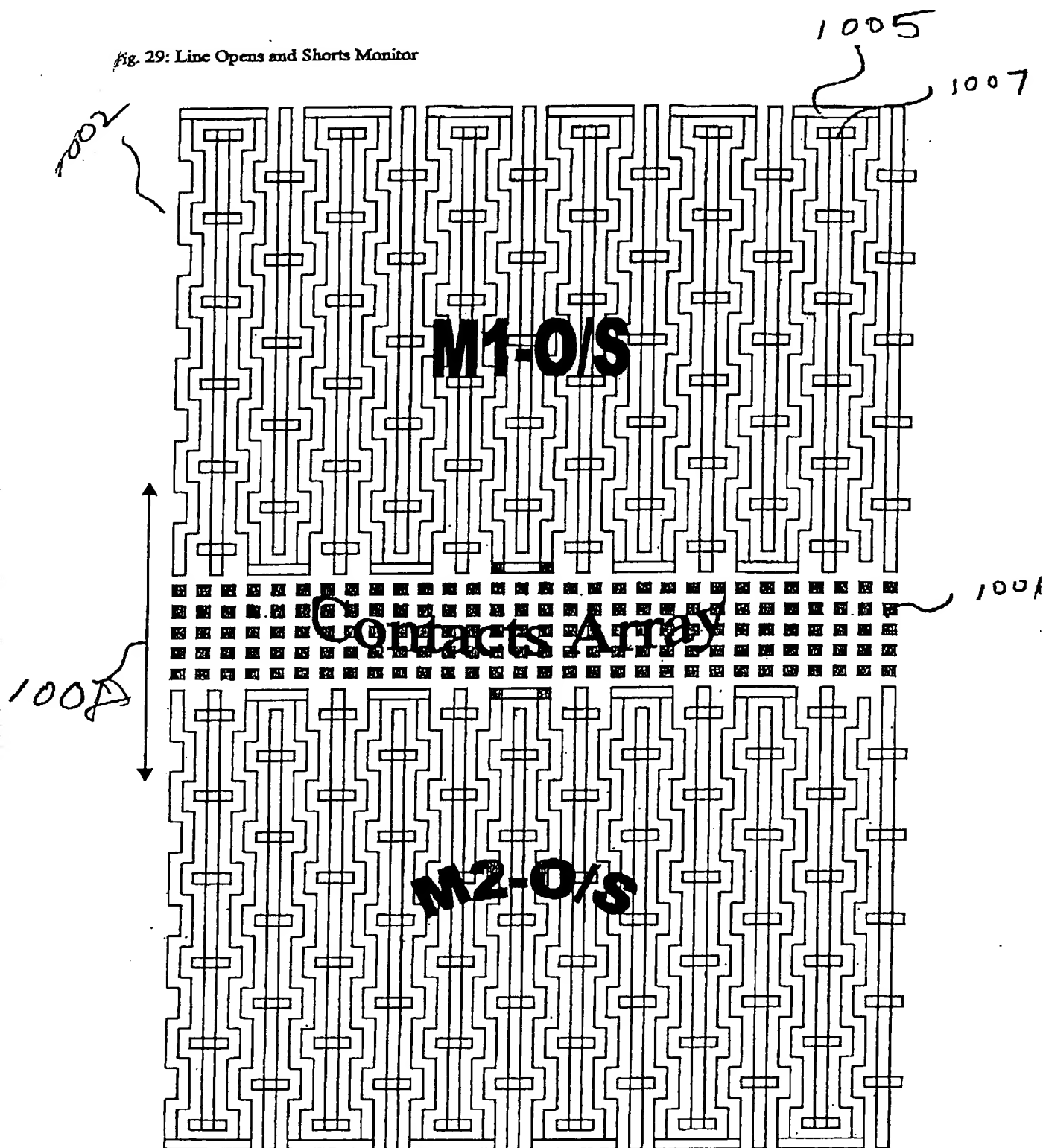


Fig. 28 : Cross-section View of the Vertical Taps over the Metal-under-Test Opens Monitor

fig. 29: Line Opens and Shorts Monitor



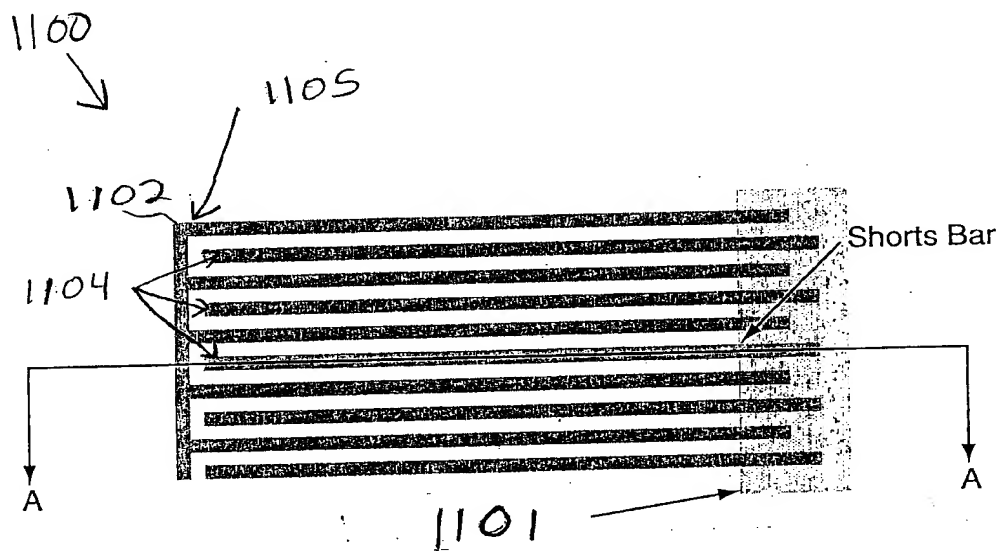


FIG 30

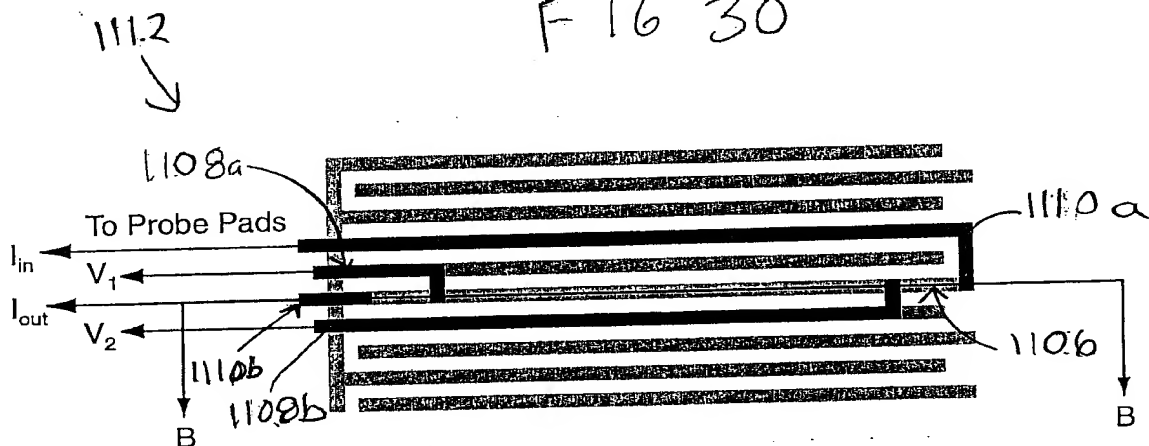
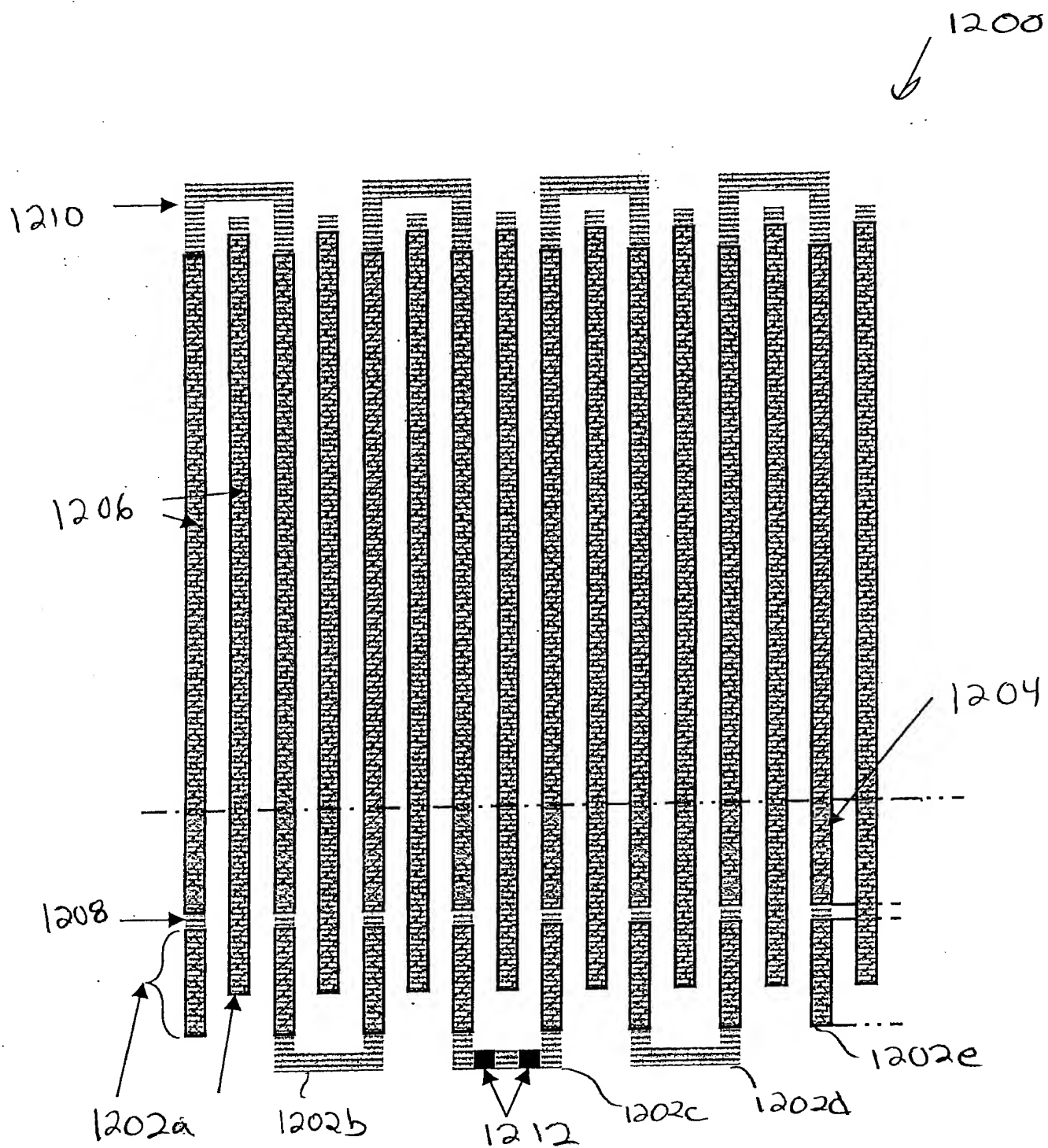
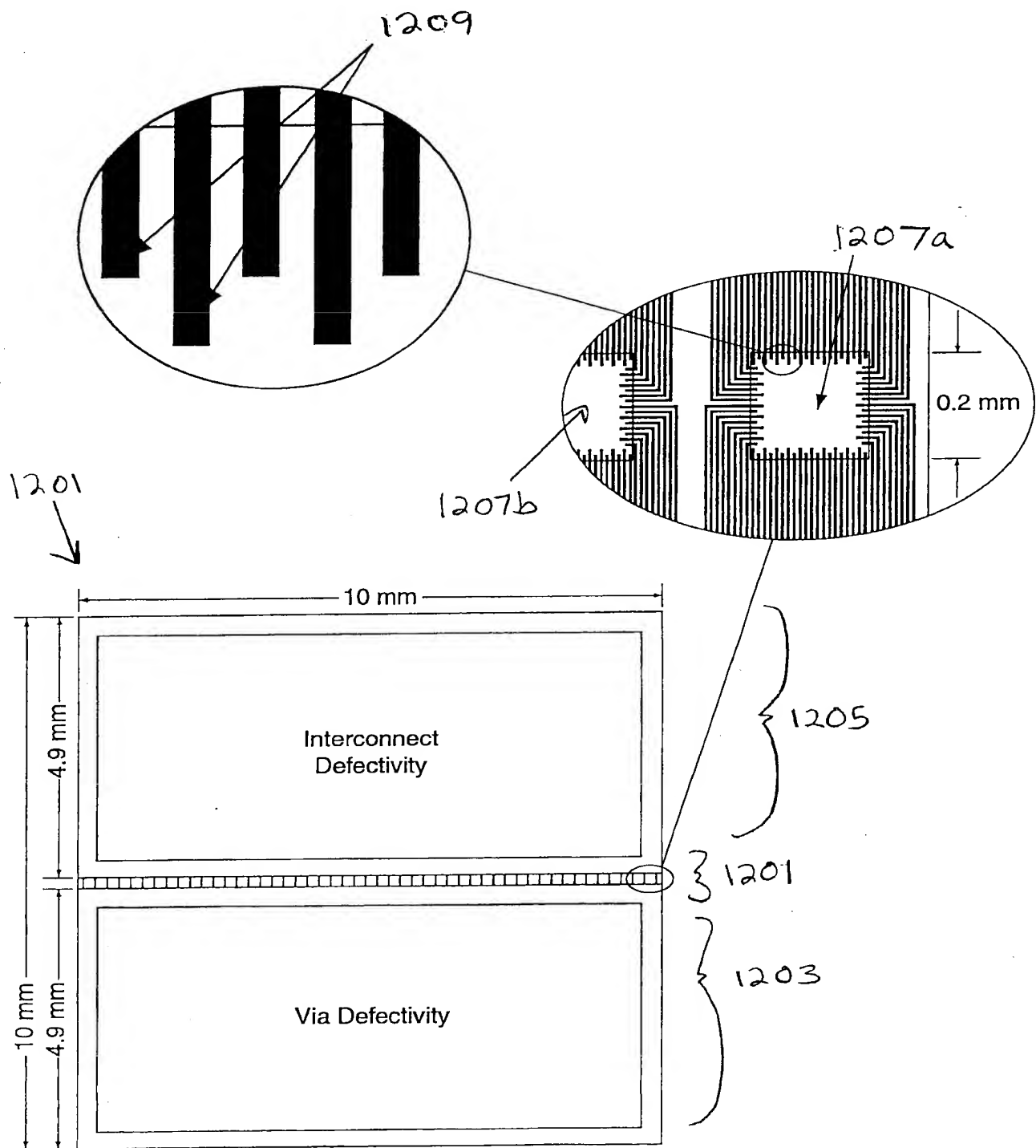


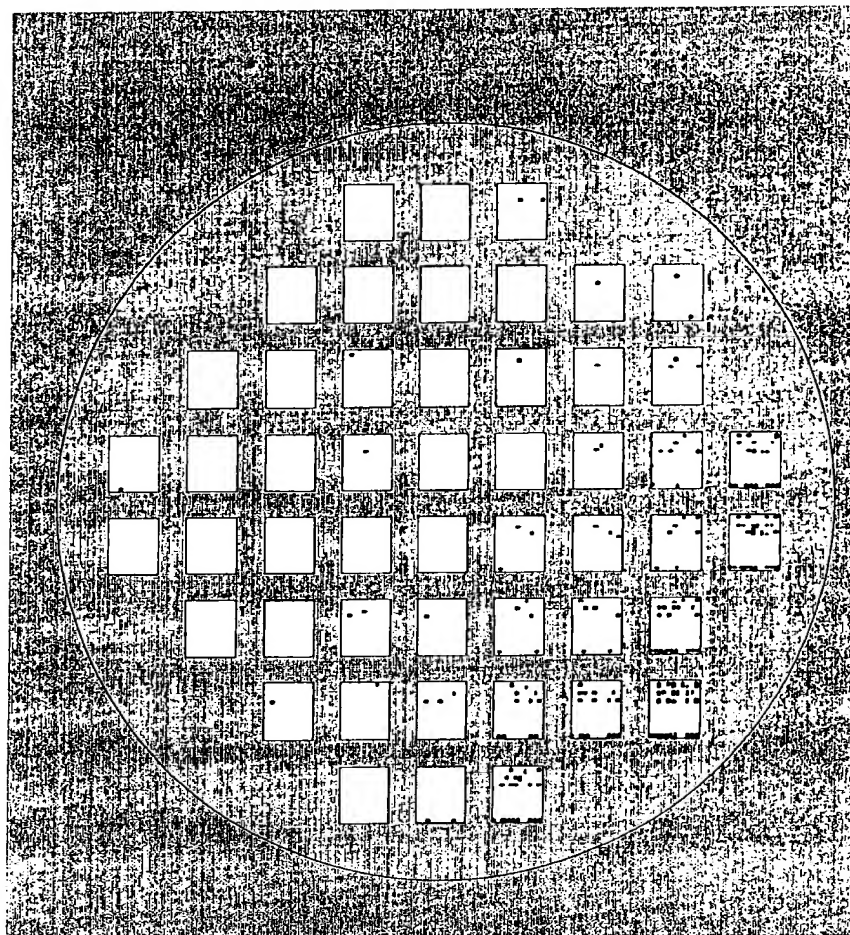
FIG 31



F16. 32

F16. 33





F16. 34

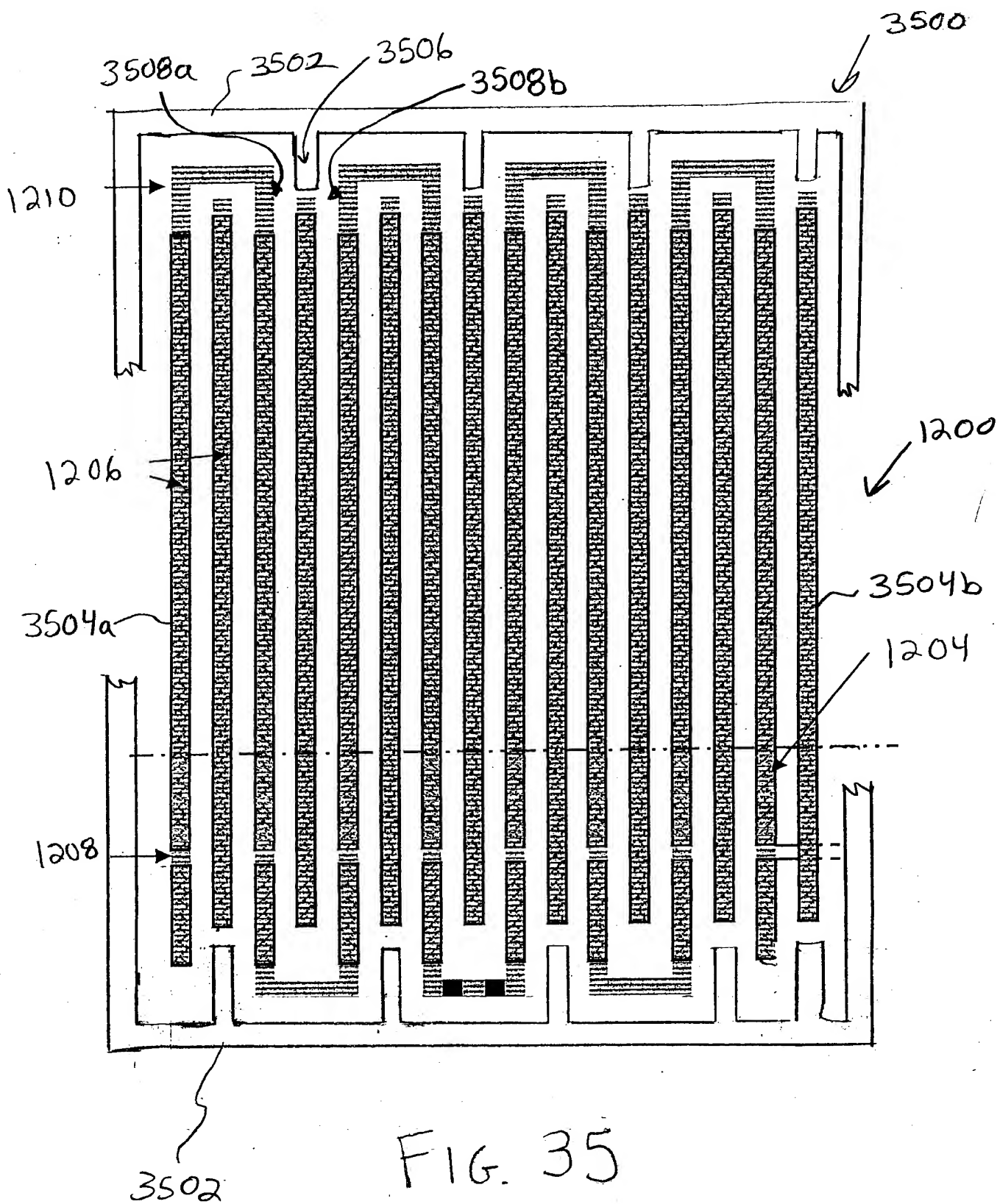


FIG. 35